REMARKS

Claims 2-4, 6-8, and 10-12 are pending in the application. Claims 2-4, 6-8, and 10-12 are rejected.

Claims 2-4, 6-8, and 10-12 are rejected under 35 U.S.C. § 112, second paragraph as being indefinite. Claims 2, 6, 10 have been amended to clarify the claimed invention. The claims have not been narrowed. It is respectfully requested the rejection be withdrawn.

Claims 2, 4, 6, 8, 10, 12 are rejected under 35 U.S.C. § 102(e) as being anticipated by Oshikiri et al. (Oshikiri). The reference Oshikiri describes two encoding methods. In a background noise/speech classification method decisions are based on calculated frame power and a calculated LSP coefficient. Importantly Oshikiri only describes a Euclidian distance between LSP coefficients for noise/speech classification.

In addition Oshikiri describes a voiced/unvoiced vowel section decides that the input signal is voiced or unvoiced. In column 1, lines 65 to column 2, line 12, the speech signal can be divided into a voice period corresponding to a vowel and an unvoiced period corresponding to a consonant.

Applicant's claimed invention describes at least the distinguishing features of: an LSP interval judging unit judging whether an interval between the LSP coefficients is equal to or less than a prescribed threshold value; and a judging unit judging whether the voice signal is a vowel when a voice part of the voice signal is sounded; and

The Office Action relies on the spectral fluctuation amount calculator in the cited reference to teach the LSP interval judging unit. However, in the cited reference the fluctuation amount is defined as a Euclidian distance between LSP coefficients according to equation 4,

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whereas applicant's is based on whether an interval between LSP coefficients are closely located on the frequency axis with respect to a threshold value.

In addition, this section of the cited reference the Office Action is relying upon (col. 11:20 – col. 12, line 18) relates to the background noise/speech decision section which is different from the voiced/unvoiced section relating to the vowel/consonants sounds. The Office Action states "then it is decided that the speech signal is background noise and not speech." However applicant is claims a judging unit judging whether the voice signal is a vowel when a voice part of the voice signal is sounded. The cited reference teach nothing about the LSP interval judging unit judging whether an interval between the LSP coefficients is equal to or less than a prescribed threshold value; and a judging unit judging whether the voice signal is a vowel when a voice part of the voice signal is sounded.

Therefore, the present invention is different from Oshikiri in the manner in which the LSP coefficient is used. In particular, according to the present invention, a voice signal is judged to be of a vowel when a corresponding LSP coefficient interval is narrow. In contrast, according to Oshikiri, a Euclidean distance between LSP coefficients is used for noise/speech classification. Pages 13 and 14 of applicant's specification describe the features of applicant's invention for an example.

Independent claims 2, 6 and 12 each recite at least the above distinguishing features. For at least the foregoing reasons it is respectfully requested these rejection of the claims be withdrawn. Dependent claims 4, 8, 10 are likewise in condition for allowance for at least the reasons set forth above and because they each recited additional distinguishing features.

Claims 3, 7, 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Oshikiri et al. in view of Taguchi.

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However Taguchi teaches away from the present invention and Oshikiri does not describe the features of the independent claims as submitted above. Further one skilled in the art would not be led to make such a combination because Taguchi teaches "the spectral distance calculation carried out simply according to the expression (2) is not satisfactory as a matching measure and deteriorates the quality of the synthesized voice." (col. 3, lines 27-30).

As pointed out above, according to the present invention, a voice signal is judged to be of a vowel when a corresponding LSP coefficient interval is narrow. In contrast, according to Oshikiri, a Euclidean distance between LSP coefficients is used for noise/speech classification. Oshikiri fails to suggest the feature of a voice signal is judged to be of a vowel when a corresponding LSP coefficient interval is narrow.

In addition the Office Action asserts, "Taguchi suggests that a more accurate spectral distance measure to identify transition portions is obtained by using the frequency interval sensitivity (col. 3, lines 21 to 30)". However col. 3, lines 27-30 Taguchi implies the expression (2) does not work and is not satisfactory. From the fact that Taguchi does not disclose any other method other than expression (2), Taguchi chooses to use a template because it is not sufficient to use a weighted Euclidean distance represented by expression (2). Thus in the totality of Taguchi, there is the implication that the interval between LSP coefficient frequencies is not very useful. Thus Taguchi's teaching are contradictory to the technology of the present invention.

The present application claim 3, for example, discloses a materialistic configuration for determining the distinction between a vowel and a consonant of a voice signal. This is in contrast to the combination of Oshikiri and Taguchi.
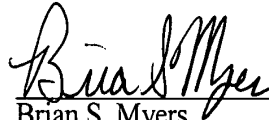
For at least the foregoing reasons it is respectfully requested the rejection of claims 3, 7, 11 be withdrawn and these claims be placed in condition of allowance.

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Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Versions with markings to show changes made."

In view of the amendments and remarks set forth above, this application is in condition for allowance which action is respectfully requested. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,

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IN THE CLAIMS:

Please amend the claims as follows:

2.(amended)   A device for a variable-rate encoding system, comprising:

an LSP coefficient calculating unit calculating an LSP coefficient obtained from a voice signal;

an LSP interval judging unit judging whether an interval between the LSP coefficients is equal to or less than a prescribed threshold value;

a judging unit judging whether [a] the voice signal is a vowel when a voice part of [a] the voice signal is sounded; and

a rate setting unit setting a voice encoding bit rate, if the voice signal is a vowel said voice encoding bit rate is set to a bit rate lower than the bit rate usually used when the voice part is sounded [if the voice signal is a vowel;

an LSP coefficient calculating unit calculating an LSP coefficient obtained from the voice signal; and

an LSP interval judging unit judging whether an interval between the LSP coefficients is equal to or less than a prescribed threshold value].

6.(amended)   A rate control method for a variable-rate encoding system, comprising:

(a) calculating unit calculating an LSP coefficient obtained from a voice signal;

(b) judging whether an interval between the LSP coefficients is equal to or less than a prescribed threshold value;

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([b]c) judging whether [a] the voice signal is a vowel when a voice part of [a] the voice signal is sounded; and

([b]d) if the voice signal is a vowel setting a voice encoding bit rate to a bit rate lower than the bit rate usually used when the voice part is sounded [if the voice signal is a vowel;

(c) calculating unit calculating an LSP coefficient obtained from the voice signal; and

(d) judging whether an interval between the LSP coefficients is equal to or less than a prescribed threshold value].

10.(amended) A computer-readable storage medium which records a program for enabling a computer to implement a rate control method for a variable-rate encoding system, the process comprising:

(a) calculating unit calculating an LSP coefficient obtained from a voice signal;

(b) judging whether an interval between the LSP coefficients is equal to or less than a prescribed threshold value;

([a]c) judging whether [a] the voice signal is a vowel when a voice part of [a] the voice signal is sounded; and

([b]d) if the voice signal is a vowel setting a voice encoding bit rate to a bit rate lower than the bit rate usually used when the voice part is sounded [if the voice signal is a vowel;

(c) calculating unit calculating an LSP coefficient obtained from the voice signal; and

(d) judging whether an interval between he LSP coefficients is equal to or less than a prescribed threshold value].

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